

Automotive Electrical Overvoltage Transient Suppressors Leded - > ATN series

Description

Overvoltage transient suppressors are designed for applications requiring a low voltage rectifier with reverse avalanche characteristics for use as reverse power transient suppressors. Developed to suppress transients in the automotive system, these devices operate in reverse mode as power avalanche rectifier and will protect electronic equipment from overvoltage conditions.

Features

- Halogen-Free
- RoHS compliant
- Glass passivated junction for reliability
- Patented construction
- Suitable for standard ISO 7637-2 or ISO16750-2;
- Fast response time
- Excellent clamping capability
- Low incremental surge resistance
- Plastic package has Underwriters Laboratory Flammability classification 94V-0

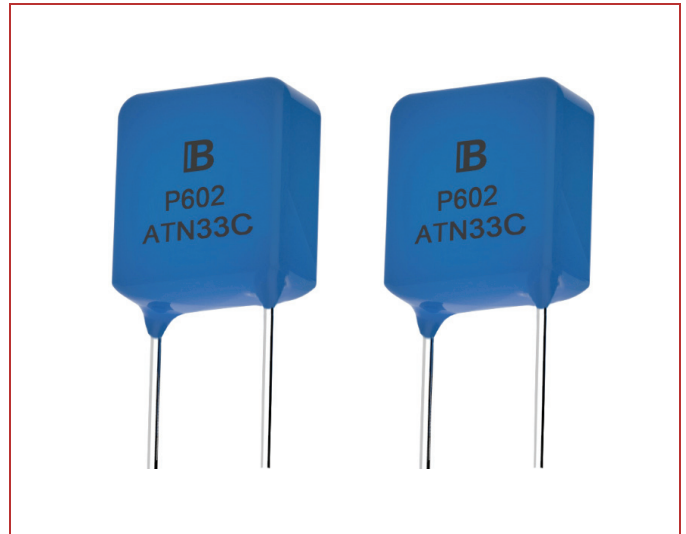
Applications

Designed to protect sensitive electronics from:

- Inductive Load Switching
- Alternator Load Dump
- GPS navigation systems

Test background

This test is a simulation of load dump transient, occurring in the event of a discharged battery being disconnected while the alternator is generating charging current and with other loads remaining on the alternator circuit at this moment; the load dump amplitude depends on the alternator speed and on the level of the alternator field excitation at the moment the battery is disconnected. In most new alternators, the load dump amplitude is suppressed (clamped) by the addition of the limiting diodes.



Maximum Ratings and Thermal Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

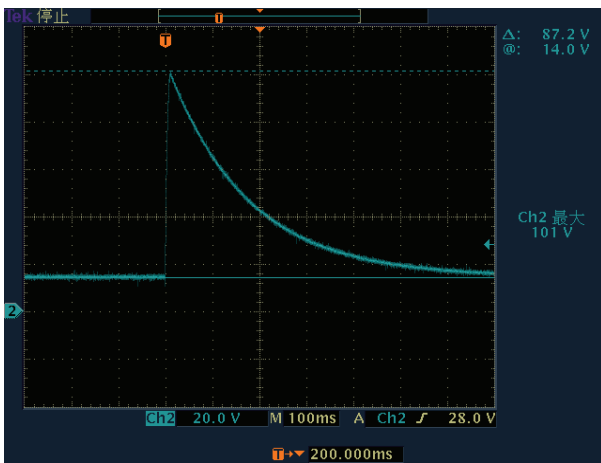
Parameter	Symbol	Value	Unit
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-50 to 150	$^\circ\text{C}$
Typical Thermal Resistance Junction to lead	R_{JL}	8.0	$^\circ\text{C}/\text{W}$
Typical Thermal Resistance Junction to Ambient	R_{JA}	40	$^\circ\text{C}/\text{W}$

Test parameters

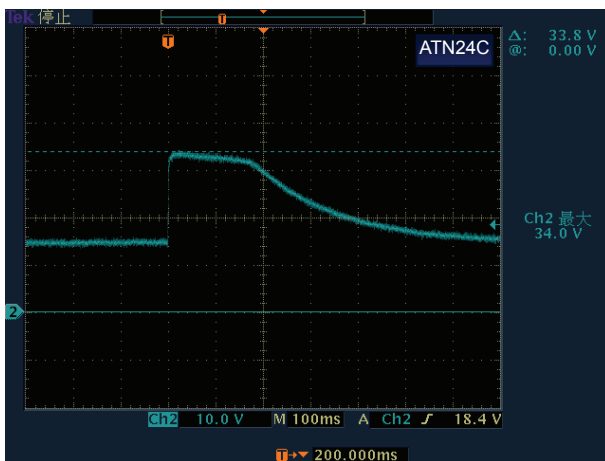
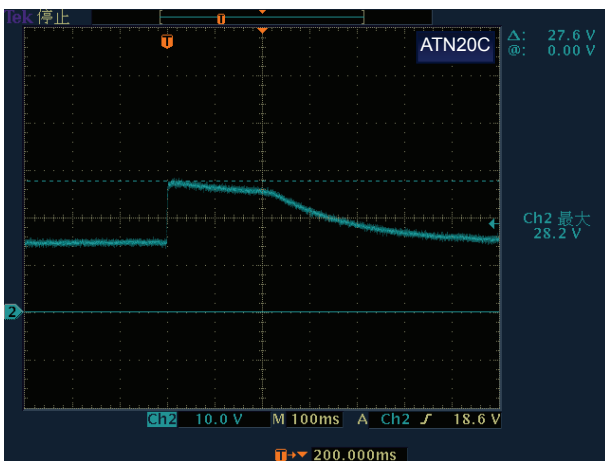
Parameter	12V system	24V system
U_s	65V to 87V	123V to 174V
R_i	0.5 Ω to 4 Ω	1 Ω to 8 Ω
t_d	40ms to 400ms	100ms to 350ms
t_r	$(10^{-0.5})$ ms	
Note	Pulse waveform see figure 1, figure 2.	

ISO 7637-2 2004 5a Waveform Simulation Test

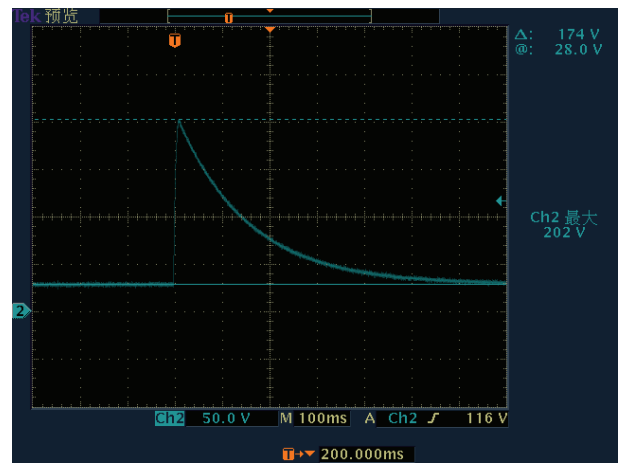
12V system 87V 1Ω 400ms DC14V
Original pulse waveform



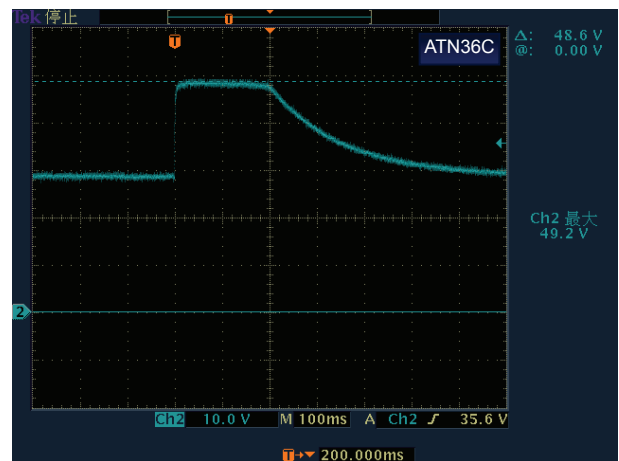
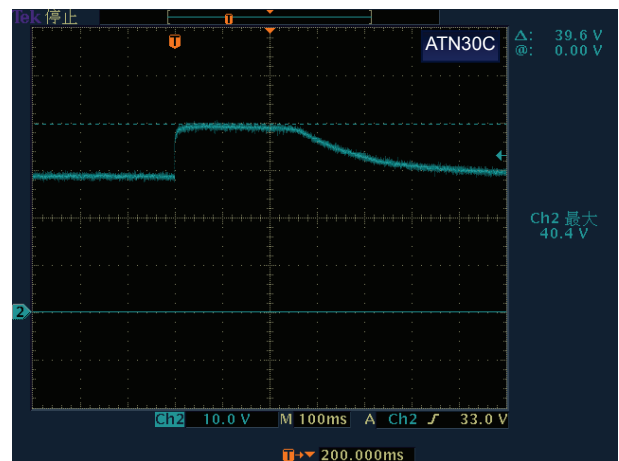
Overvoltage transient suppressors (ATN20C/ATN24C)
Clamped pulse waveform



24V system 174V 3Ω 350ms DC28V
Original pulse waveform



Overvoltage transient suppressors (ATN30C/ATN36C)
Clamped pulse waveform



Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

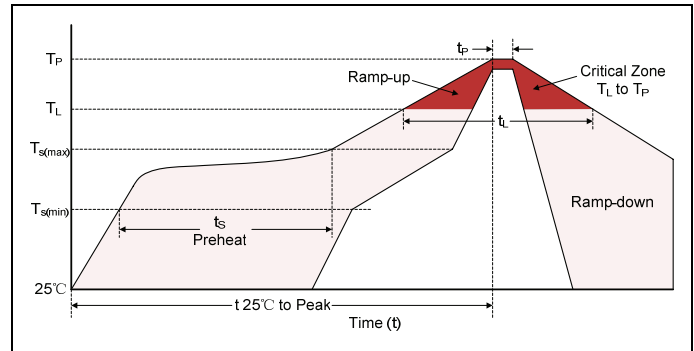
Part Number	Breakdown Voltage @ I_T		Test Current	Reverse Stand-Off Voltage	Reverse Leakage @ V_{RWM}
	$V_{BR\ MIN.}$ (V)	$V_{BR\ MAX.}$ (V)	I_T (mA)	V_{RWM} (V)	I_R (μA)
ATN20C	21.0	25.0	5.0	20.0	10.0
ATN24C	25.0	30.0	5.0	24.0	10.0
ATN30C	33.0	38.0	5.0	30.0	10.0
ATN33C	35.0	40.0	5.0	33.0	10.0
ATN36C	38.0	45.0	5.0	36.0	10.0

Par Number	Suitable ISO 7637-2 2004 5a test waveform								
	Maximum Clamping Voltage	Voltage level		Resistance Level					
	V_c (V)	87V 400mS	174V 350mS	0.5 Ω	1 Ω	2 Ω	3 Ω	4 Ω	8 Ω
ATN20C	33.0	x	--	--	x	x	x	x	x
ATN24C	39.0	x	--	--	x	x	x	x	x
ATN30C	50.0	--	x	--	--	--	x	x	x
ATN33C	54.0	--	x	--	--	--	x	x	x
ATN36C	57.0	--	x	--	--	--	x	x	x

Note: 'x' representatives meets this test condition;

Soldering Parameters

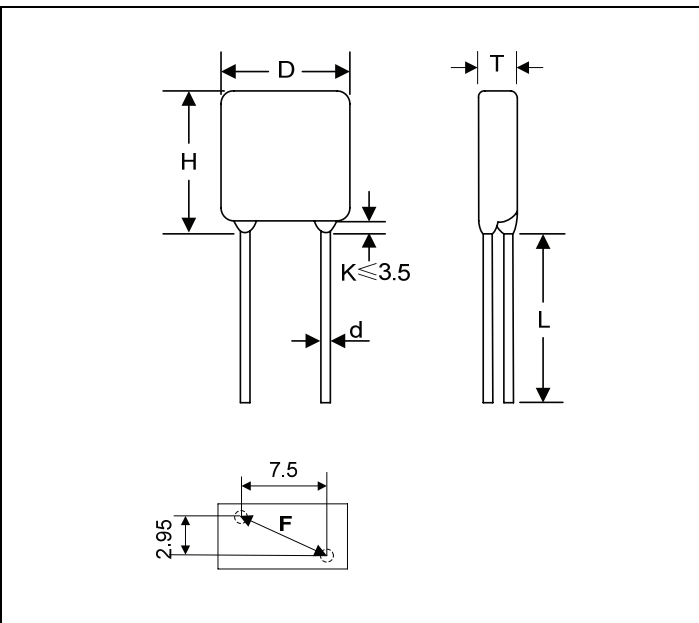
Reflow Condition		Lead-free assembly
Pre Heat	- Temperature Min($T_{s(min)}$)	150°C
	- Temperature Max($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60~180 seconds
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (min to max) (t_s)	60~150 seconds
Peak Temperature (T_P)		260 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (t_p)		20~40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		280°C



Flow/Wave Soldering (Solder Dipping)

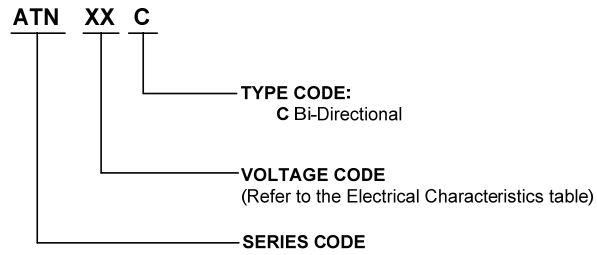
Peak Temperature:	265°C
Dipping Time:	10 seconds
Soldering:	1 time

Dimensions

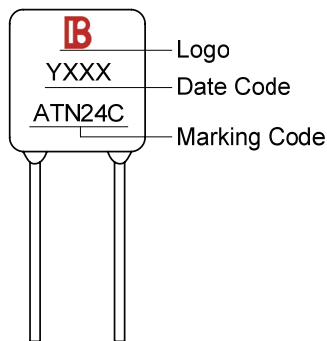


ATN Series				
Items	Millimeters		Inches	
	Min.	Max.	Min.	Max.
D	-	13.0	-	0.512
H	-	16.0	-	0.630
T	-	6.5	-	0.256
L	10.0	-	0.394	-
K	-	3.5	-	0.138
F	8.05±0.8		0.317±0.031	
d	0.8±0.1		0.031±0.004	

Part Numbering System



Part Marking System



Packaging

<p>Bulk</p> <p>65 Max. 245 Max. 185 Max.</p>	<p>200pcs/box</p>
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Note: We will always keep the technical specification updates, to customers provide with better products.